# UNISONIC TECHNOLOGIES CO., LTD

## 15N25-P

*Power MOSFET*

# 15A, 250V   N-CHANNEL
# POWER MOSFET

TO-220F1

■   **DESCRIPTION**

The UTC **15N25-P** is an N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **15N25-P** is universally applied in low voltage such as automotive, high efficiency switching for DC/DC converters and DC motor control, etc.

■   **FEATURES**

* $R_{DS(ON)}$=0.25Ω @ $V_{GS}$=10V, $I_D$=7.5A
* Low Gate Charge (Typical 33nC)
* Low $C_{RSS}$ (Typical 25pF)
* High Switching Speed

■   **SYMBOL**

2.Drain

1.Gate
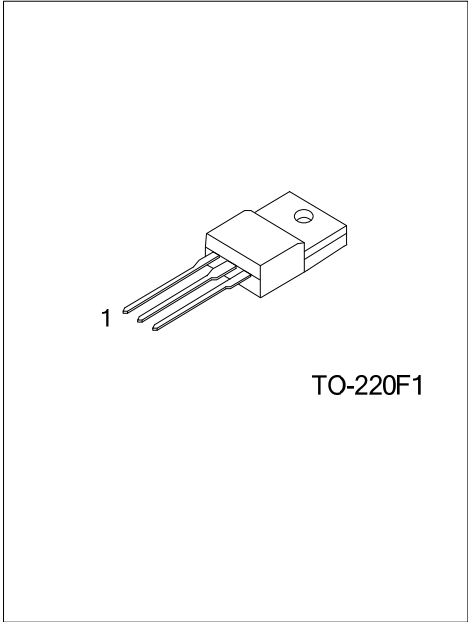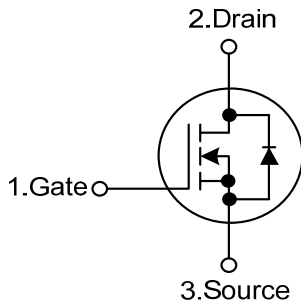
3.Source

■   **ORDERING INFORMATION**

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| 15N25L-TF1-T | 15N25G-TF1-T | TO-220F1 | G | D | S | Tube |
| 15N25L-TF1-R | 15N25G-TF1-R | TO-220F1 | G | D | S | Tape Reel |

Note:   Pin Assignment: G: Gate   D: Drain     S: Source

15N25L-TF1-T

(1)Packing Type

(2)Package Type

(3)Lead Free

(1) T: Tube, R: Tape Reel

(2) TF1: TO-220F1

(3) L: Lead Free, G: Halogen Free

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# 15N25-P

■ **ABSOLUTE MAXIMUM RATINGS** (unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 250 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±30 | V |
| Continuous Drain Current | Continuous | $I_D$ | 15 | A |
| | Pulsed | $I_{DM}$ | 60 | A |
| Single Pulsed Avalanche Current | | $I_{AS}$ | 15 | A |
| Single Pulsed Avalanche Energy | | $E_{AS}$ | 340 | mJ |
| Power Dissipation | | $P_D$ | 83 | W |
| Junction Temperature | | $T_J$ | +150 | °C |
| Storage Temperature | | $T_{STG}$ | -55 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **THERMAL DATA**

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction to Ambient | $\theta_{JA}$ | 110 | °C/W |
| Junction to Case | $\theta_{JC}$ | 1.5 | °C/W |

■ **ELECTRICAL CHARACTERISTICS**

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | $I_D$=250µA, $V_{GS}$=0V | 250 | | | V |
| Drain-Source Leakage Current | | $I_{DSS}$ | $V_{DS}$=250V, $V_{GS}$=0V | | | 1 | µA |
| Gate-Source Leakage Current | Forward | $I_{GSS}$ | $V_{GS}$=+30V, $V_{DS}$=0V | | | +100 | nA |
| | Reverse | | $V_{GS}$=-30V, $V_{DS}$=0V | | | -100 | nA |
| **ON CHARACTERISTICS** | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250µA | 2 | | 4 | V |
| Static Drain-Source On-State Resistance | | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=7.5A | | 0.18 | 0.25 | Ω |
| **DYNAMIC PARAMETERS** | | | | | | | |
| Input Capacitance | | $C_{ISS}$ | $V_{GS}$=0V, $V_{DS}$=25V, f=1.0MHz | | 830 | 1080 | pF |
| Output Capacitance | | $C_{OSS}$ | | | 200 | 260 | pF |
| Reverse Transfer Capacitance | | $C_{RSS}$ | | | 25 | 33 | pF |
| **SWITCHING PARAMETERS** | | | | | | | |
| Total Gate Charge | | $Q_G$ | $V_{GS}$=10V, $V_{DD}$=120V, $I_D$=18A | | 33 | 40 | nC |
| Gate to Source Charge | | $Q_{GS}$ | | | 6 | | nC |
| Gate to Drain Charge | | $Q_{GD}$ | | | 6.7 | | nC |
| Turn-ON Delay Time | | $t_{D(ON)}$ | $V_{DD}$=30V, $I_D$=1A, $R_G$=25Ω, $V_{GS}$=10V, $R_L$=30 Ω | | 23 | 35 | ns |
| Rise Time | | $t_R$ | | | 50 | 74 | ns |
| Turn-OFF Delay Time | | $t_{D(OFF)}$ | | | 314 | 332 | ns |
| Fall-Time | | $t_F$ | | | 89 | 97 | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | | |
| Maximum Body-Diode Continuous Current | | $I_S$ | | | | 15 | A |
| Maximum Body-Diode Pulsed Current | | $I_{SM}$ | | | | 60 | A |
| Drain-Source Diode Forward Voltage | | $V_{SD}$ | $I_S$=15A, $V_{GS}$=0V | | | 1.5 | V |